

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

In the Official Action, the Examiner objects to the disclosure because "Fig. 1" on line 22 of page 9 should be "Fig. 2." In response, page 9 of the disclosure has been amended as suggested by the Examiner. Accordingly, it is respectfully requested that the objection to the disclosure be withdrawn.

In the Official Action, the Examiner rejects claims 1-10 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,694,237 to Melville (hereinafter "Melville") in view of U.S. Patent No. 6,232,861 to Asada (hereinafter "Asada"). With regard to claims 1-7, independent claims 1 and 5 have been amended to clarify their distinguishing features. With regard to claims 8-10, Applicants respectfully traverse the Examiner's rejection under 35 U.S.C. § 103(a) for at least the reasons set forth below.

Turning now to the prior art, Melville discloses in Figure 7 a phase locking circuit (200) comprising a mechanical resonant scanner (10), a phase locked loop circuit (202), and a low pass filter (hereinafter LPF) (201). In Melville, a phase comparator (203) inside the phase locked loop circuit (202) compares a phase of a sensor output (90) and a phase of a scanner drive output (204). An output of the output comparator (203) is led to the LPF (201). Further, an output of the LPF (201) is input to a VCO 205 such that the VCO 205 generates a drive output to reduce the phase difference (see column 7, lines 14-56). The LPF (201) is not clearly explained in the specification of Melville. It is considered in view of the structure, however, that the LPF (201) outputs an average value of the phase comparison result from the comparator (203) that is output in a pulse shape.

Asada discloses a structure of detecting a displacement angle of a movable plate by detection coils (column 2, lines 18-31). However, Asada aims to detect the displacement angle of the movable plate by detecting a variation in the mutual induction between the drive coil (flat coil 7) and the detection coil (detection coil 12A, 12B) and, unlike the present invention, does not disclose eliminating the mutual induction as noise.

On the other hand, the present invention provides an actuator drive apparatus capable of eliminating the influence of the mutual induction effect of a drive coil and a detection coil (page 5, lines 17-21, etc.). In the present invention, a detection signal in a period of appearance of the mutual induction component is only eliminated by the high frequency eliminating means and thereby the detection signal, which is not affected by the mutual induction, is obtained (page 16, lines 14-20, etc.).

For this reason, the LPF serving as the high frequency elimination circuit is arranged between the detection coil (sensor) and the resonant frequency following/amplitude controlling circuit (Fig. 6, Fig. 10 and Fig. 11). In this structure, if the actuator drive apparatus is driven with a rectangular wave, the high frequency voltage component generated at the detection coil by the mutual induction between the drive coil and the detection coil can be eliminated.

Thus, the LPF of the Melville patent is quite different functionally from the LPF of the present invention serving as the high frequency elimination circuit. Moreover, Melville does not utilize a detection coil. Melville therefore does not suggest or disclose eliminating the high frequency component caused by the mutual induction.

Independent claims 1 and 5 have been amended to recite "control circuit" after the "high frequency elimination circuit." Furthermore, independent claims 1 and 5 are further

amended to clarify that the "output signal of said detection coil" is fed back to the drive signal after passing through the high frequency elimination circuit (e.g. through a resonance tracking/amplitude control circuit). The amendments to independent claims 1 and 5 are fully supported in the original disclosure. Thus, no new matter has been entered into the disclosure by way of the present amendment to independent claims 1 and 5.

With regard to independent claim 8, similarly to claim 1, the same recites that the detection signal in a period of appearance of the mutual induction component is eliminated and thereby the detection signal, which is not affected by the mutual induction, is obtained.

Thus, independent claims 1, 5, and 8, are not rendered obvious by the cited references because neither the Melville patent nor the Asada patent, whether taken alone or in combination, teach or suggest an actuator drive apparatus and method having the features described above. Accordingly, claims 1, 5, and 8, patentably distinguish over the prior art and are allowable. Claims 2-4, 6, 7, 9, and 10, being dependent upon claims 1, 5, and 8, are thus allowable therewith. Consequently, the Examiner is respectfully requested to withdraw the rejection of claims 1-10 under 35 U.S.C. § 103(a).

In view of the above, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be

allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,



Thomas Spinelli

Registration No.: 39,533

Scully, Scott, Murphy & Presser
400 Garden City Plaza
Garden City, New York 11530
(516) 742-4343
TS:cm